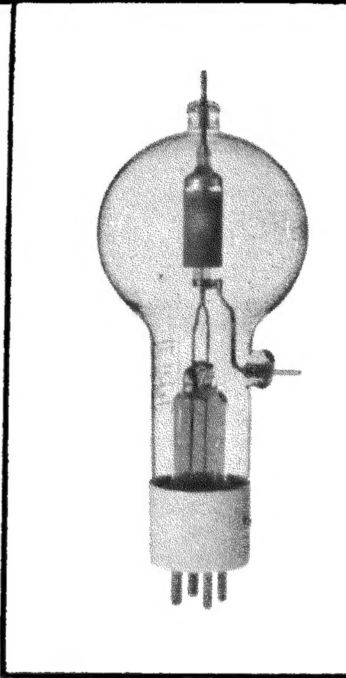


EITEL-McCULLOUGH, INC.
SAN BRUNO, CALIFORNIA

75TH

MEDIUM-MU TRIODE
•
MODULATOR
OSCILLATOR
AMPLIFIER



The Eimac 75TH is a medium-mu, high-vacuum transmitting triode intended for amplifier, oscillator and modulator service. It has a maximum plate dissipation rating of 75 watts. Cooling of the 75TH is accomplished by radiation from the plate, which operates at a visibly red temperature at maximum dissipation, and by air circulation around the envelope.

GENERAL CHARACTERISTICS

ELECTRICAL

Filament: Thoriated tungsten

Voltage	5.0	volts
Current	6.25	amperes

Amplification Factor (Average) - 20

Direct Interelectrode Capacitances (Average)

Grid-Plate	2.3	μμfd.
Grid-Filament	2.7	μμfd.
Plate-Filament	0.3	μμfd.

Transconductance (i_b=225 ma., E_b=3000 v., E_c=−40 v.) 4150 μmhos

MECHANICAL

Base	Medium 4-pin bayonet, ceramic, RMA type M8-078
Basing	RMA type 2M
Cooling	Radiation and air circulation

Maximum Overall Dimensions:

Length	7.25	inches
Diameter	2.81	inches

Net Weight	3	ounces
Shipping Weight (Average)	1.5	pounds

RADIO FREQUENCY POWER AMPLIFIER AND OSCILLATOR

Class-C Telegraphy (Key-down conditions, 1 tube)

MAXIMUM RATINGS (Frequencies below 40 Mc.)

D-C PLATE VOLTAGE	3000 MAX. VOLTS.
D-C PLATE CURRENT	225 MAX. MA.
PLATE DISSIPATION	75 MAX. WATTS
GRID DISSIPATION	16 MAX. WATTS

TYPICAL OPERATION (Frequencies below 40 Mc.)

D-C Plate Voltage	1000	1500	2000	volts
D-C Grid Voltage	−80	−125	−200	volts
D-C Plate Current	215	167	150	ma.
D-C Grid Current	40	30	32	ma.
Peak R-F Grid Input Voltage (approx.)	290	250	325	volts
Driving Power (approx.)	9	6	10	watts
Plate Power Input	215	250	300	watts
Plate Dissipation	75	75	75	watts
Plate Power Output	140	175	225	watts

AUDIO FREQUENCY POWER AMPLIFIER AND MODULATOR

Class-B (Sinusoidal wave, two tubes unless otherwise specified)

MAXIMUM RATINGS

D-C PLATE VOLTAGE	3000 MAX. VOLTS
MAX-SIGNAL D-C PLATE CURRENT, PER TUBE	225 MAX. MA.
PLATE DISSIPATION, PER TUBE	75 MAX. WATTS
GRID DISSIPATION, PER TUBE	16 MAX. WATTS

TYPICAL OPERATION

D-C Plate Voltage	1000	1500	2000	volts
D-C Grid Voltage (approx.)	−25	−65	−90	ma.
Zero-Signal D-C Plate Current	90	67	50	ma.
Max-Signal D-C Plate Current	350	267	225	ma.
Effective Load, Plate-to-Plate	5300	11,400	19,300	ohms
Peak A-F Grid Input Voltage (per tube)	175	165	175	volts
Max-Signal Driving Power (approx.)	7	4	3	watts
Max-Signal Plate Dissipation (per tube)	75	75	75	watts
Max-Signal Plate Power Output	200	250	300	watts

APPLICATION

MECHANICAL

Mounting—The 75TH must be mounted vertically, base up or base down. Flexible connecting straps should be provided between the grid and plate terminals and the external grid and plate circuits. The tube must be protected from severe vibration and shock.

Cooling—Provision should be made for ample circulation of air around the 75TH. In the event that the design of the equipment restricts natural circulation, a small fan or centrifugal blower should be used to provide additional cooling for the envelope and plate and grid seals.

ELECTRICAL

Filament Voltage—The filament voltage, as measured directly at the filament pins, should be between 4.75 and 5.25 volts.

Bias Voltage—Although there is no maximum limit on the bias voltage which may be used on the 75TH, there is little advantage in using bias voltages in excess of those given under "Typical Operation," except in certain very specialized applications. Where bias is obtained by a grid leak, suitable protective means must be provided to prevent excessive plate dissipation in the event of loss of excitation.

Plate Voltage—The plate-supply voltage for the 75TH should not exceed 3000 volts. In most cases there is little advantage in using plate-supply voltages higher than those given under "Typical Operation" for the power output desired.

Grid Dissipation—The power dissipated by the grid of the 75TH must not exceed 16 watts. Grid dissipation may be calculated from the following expression:

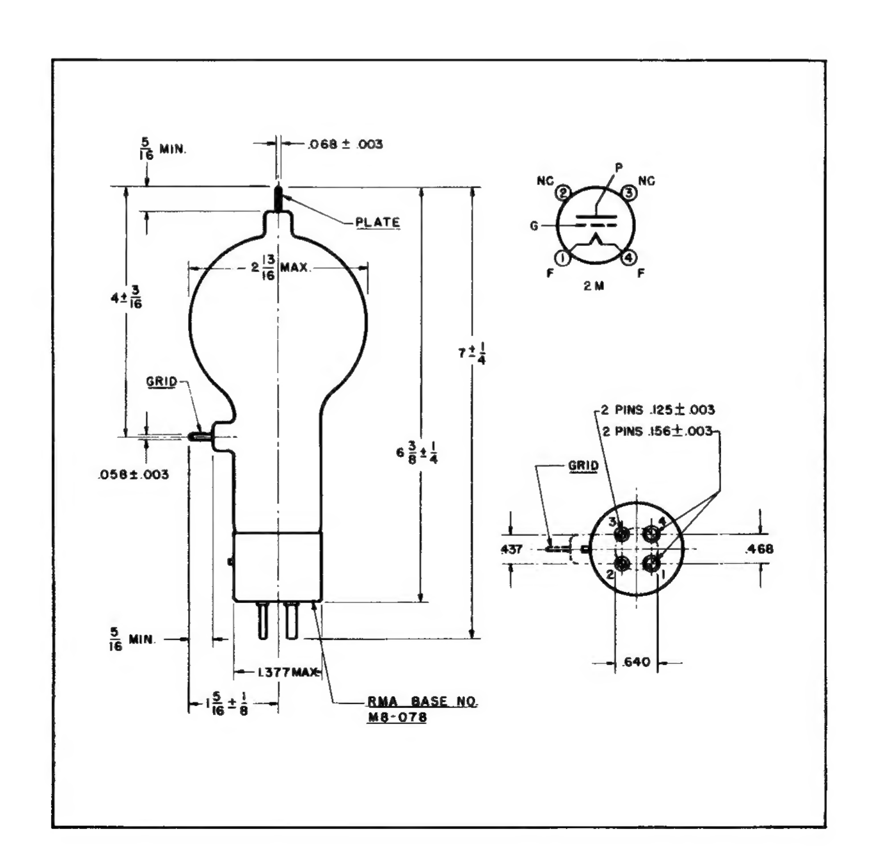
$$P_g = e_{cmp} I_c$$

where P_g = Grid dissipation,
e_{cmp} = Peak positive grid voltage, and
I_c = D-c grid current.

e_{cmp} may be measured by means of a suitable peak voltmeter connected between filament and grid.[1] In equipment in which the plate loading varies widely, such as oscillators used for radio-frequency heating, care should be taken to make certain that the grid dissipation does not exceed the maximum rating under any condition of loading.

Plate Dissipation—Under normal operating conditions, the power dissipated by the plate of the 75TH should not be allowed to exceed 75 watts. Plate dissipation in excess of the maximum rating is permissible for short periods of time, such as during tuning procedures.

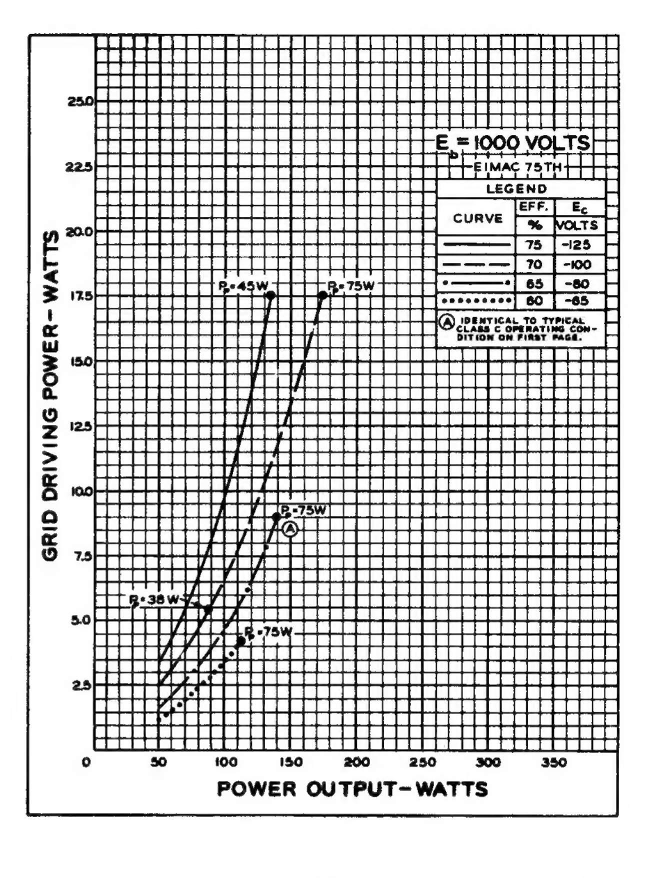
[1] For suitable peak v.t.v.m. circuits see, for instance, "Vacuum Tube Ratings," **Eimac News**, January, 1945. This article is available in reprint form on request.

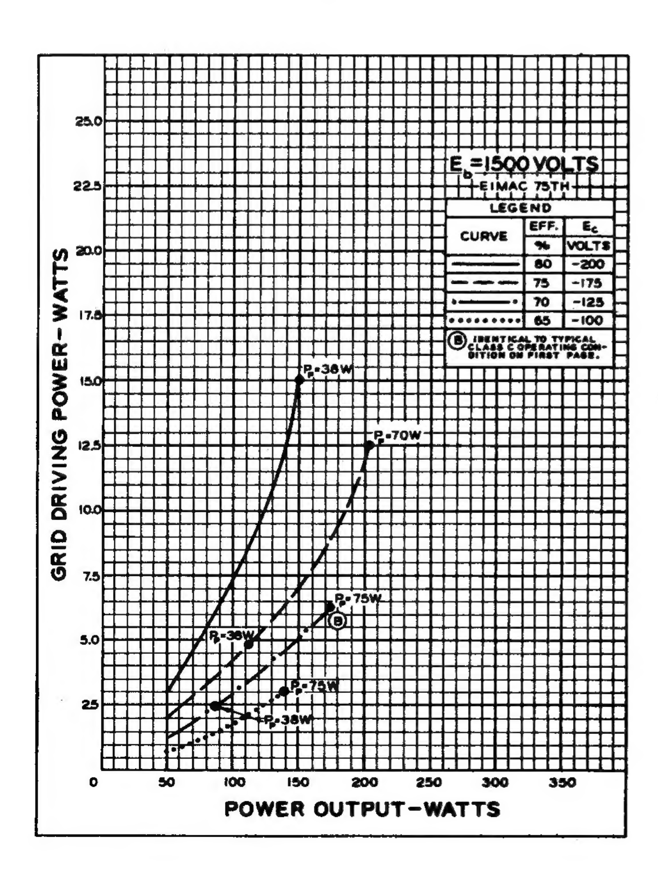


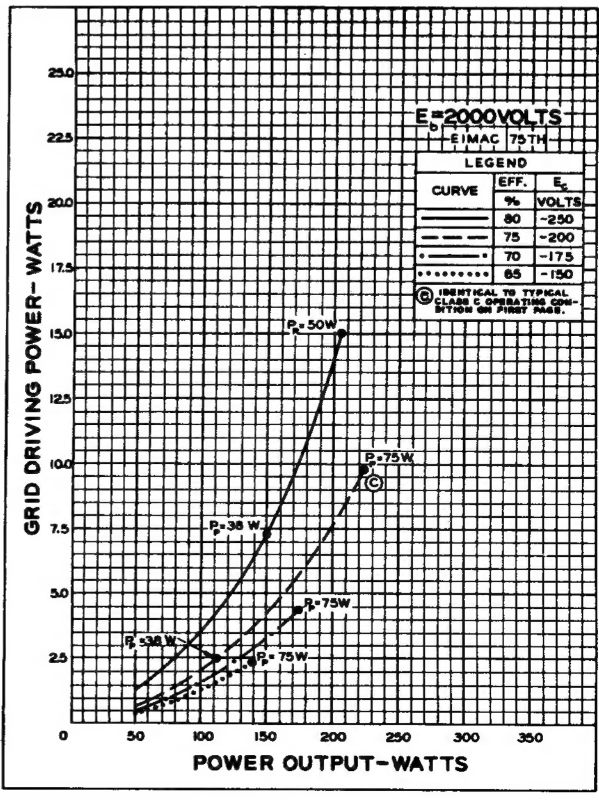
DRIVING POWER vs. POWER OUTPUT

The three charts on this page show the relationship of plate efficiency, power output and grid driving power at plate voltages of 1000, 1500 and 2000 volts. These charts show combined grid and bias losses only. The driving power and power output figures do not include circuit losses. The plate dissipation in watts is indicated by P_p.

Points A, B, and C are identical to the typical Class C operating conditions shown on the first page under 1000, 1500, and 2000 volts respectively.







GRID VOLTAGE —VOLTS

-300 -200 -100 0 100 200 300 400 500 600

PLATE VOLTAGE — VOLTS

0 250 500 750 1000 1250 1500 1750 2000 2250 2500 2750 3000 3250

GRID CURRENT-MILLIAMPERES

400 350 300 250 200 150 100 50 20 0

20 0

PLATE CURRENT-AMPERES

0 .100 .200 .400 .600 .800 1.00 1.20 1.40

EIMAC 75TH CONSTANT CURRENT CHARACTERISTICS

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